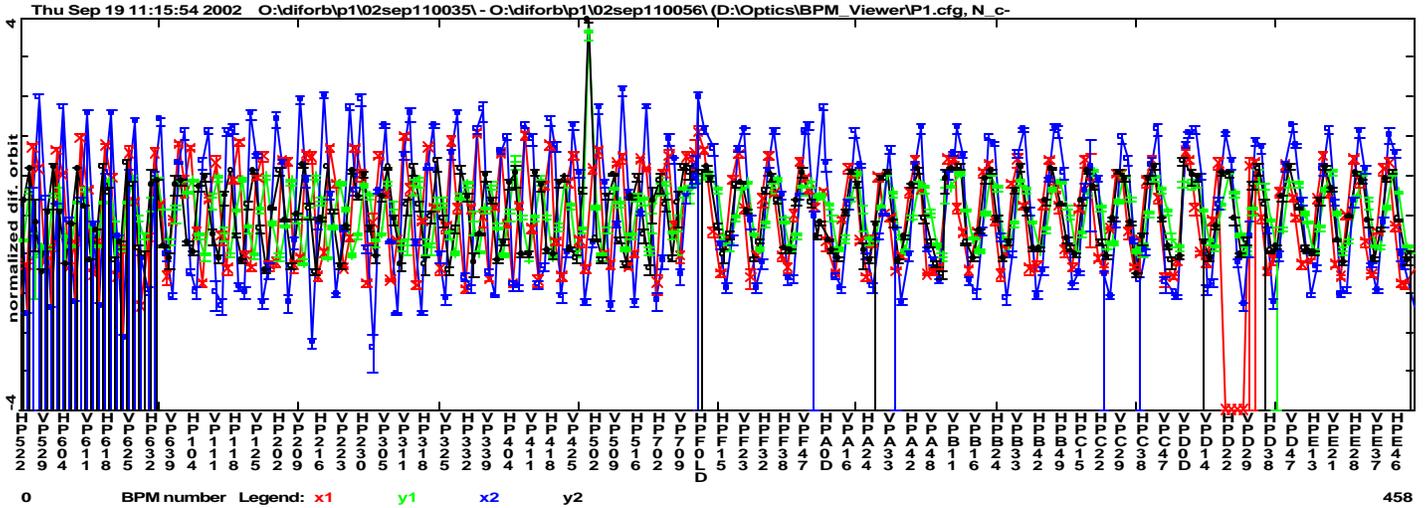
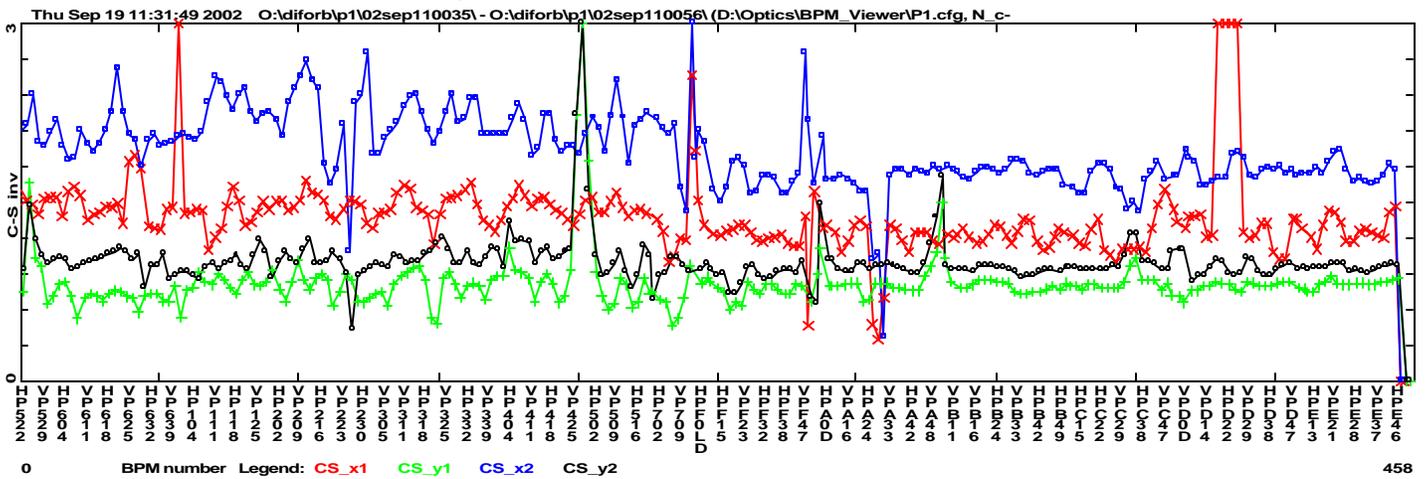


Transfers from MI to Tevatron (P1 line)

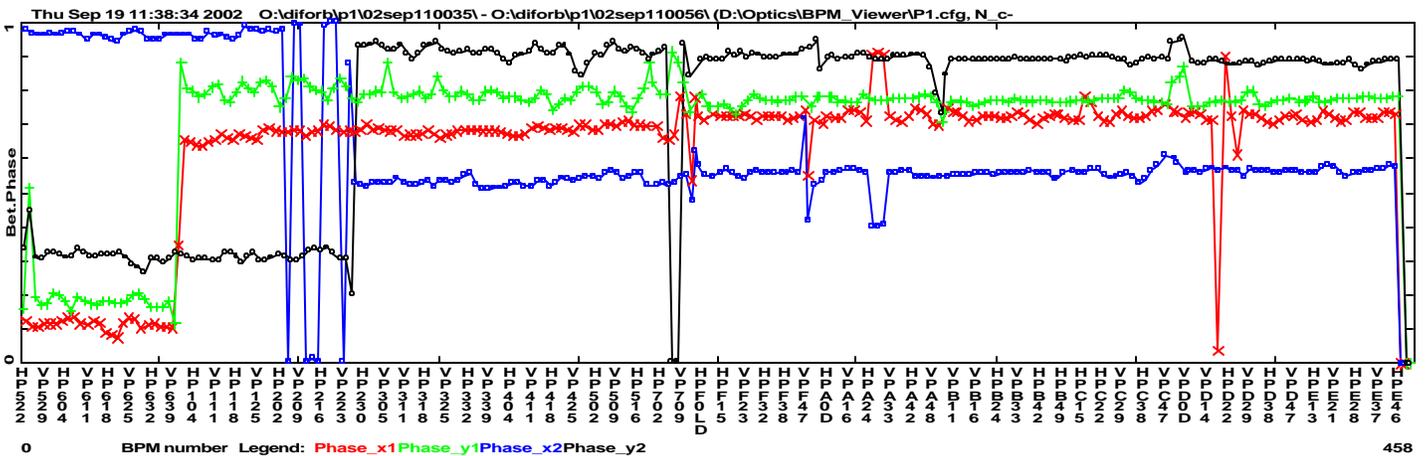


Differential normalized orbits in MI, P1 line and Tevatron



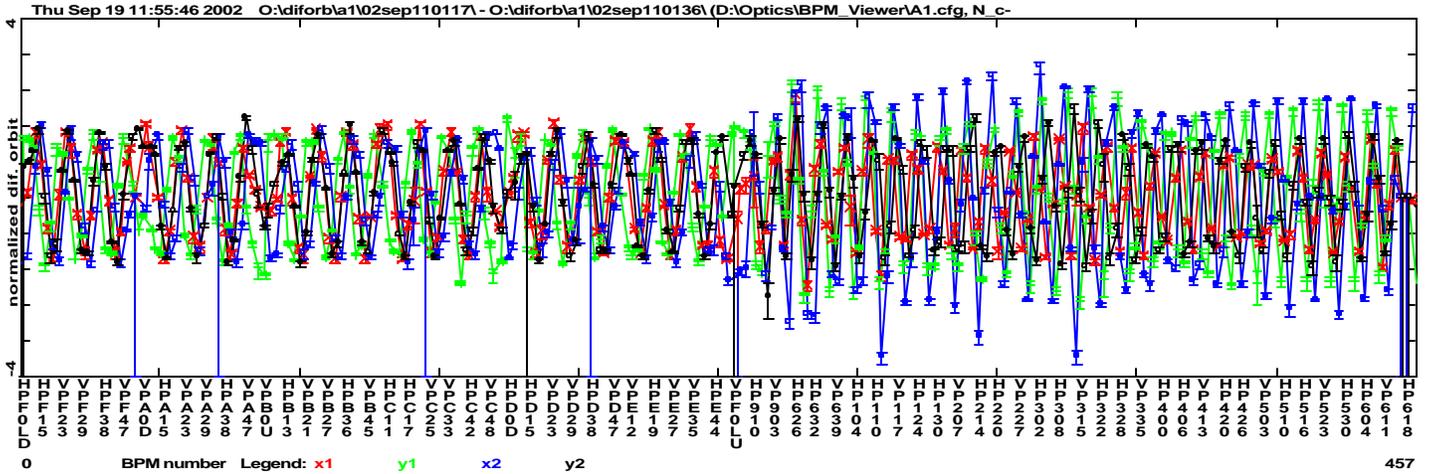
Effective betatron amplitude in MI, P1 line and Tevatron. Independent measurements in Tevatron yielded that the Tevatron BPMs underreport the beam displacement by the factors $A_x = 0.925$, $A_y = 0.95$

Amplitude ratios: MI/Tevatron=	0.86 (x1)
	0.85 (x2)
	0.91 (y1)
	0.98 (y2)

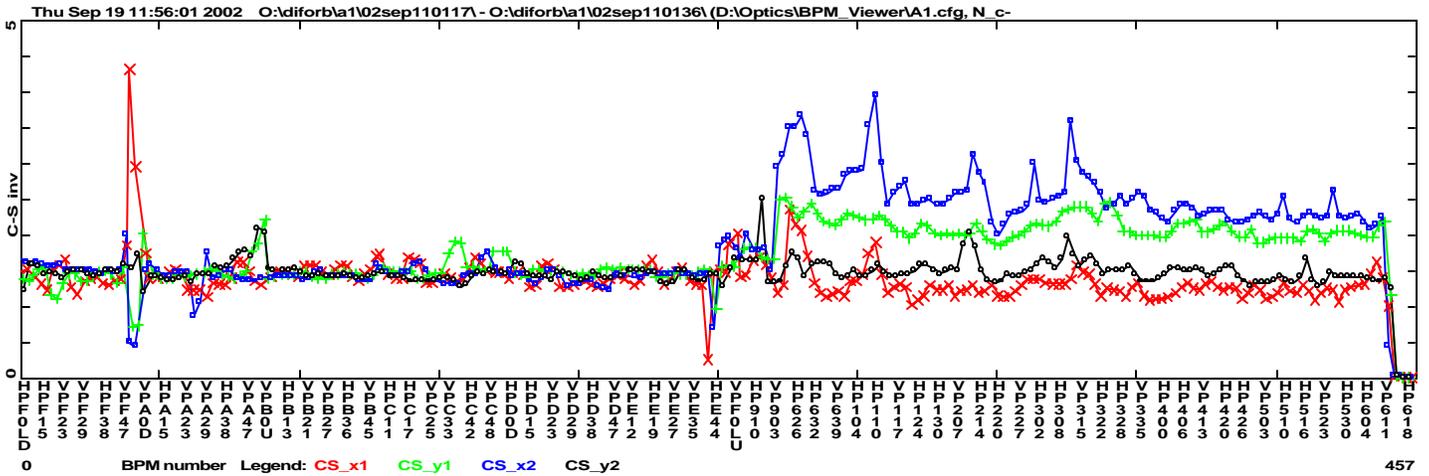


Betatron phases relative to the design betatron phase advance

Transfers from Tevatron to MI (A1 line)

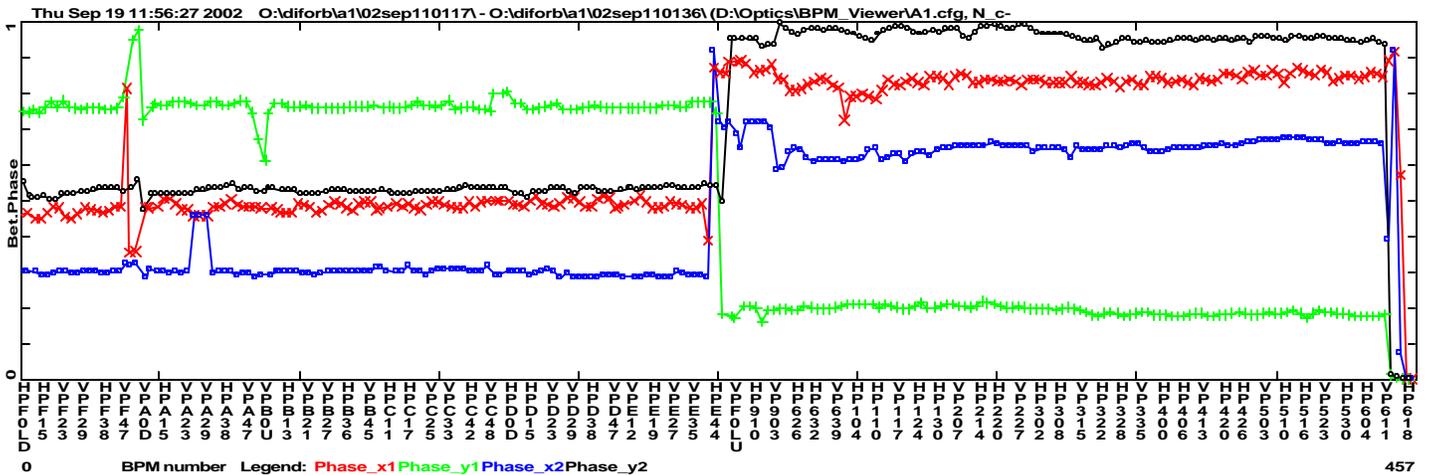


Differential normalized orbits in Tevatron, A1 line and MI



Effective betatron amplitude in Tevatron, A1 line and MI.
 Emit.growth due to bet.mism:(x) $\sim 1.36^2=1.85$, (y) $\sim 1.31^2=1.71$
 Meas.round trip emit.growth :(x) ~ 2.0 , (y) ~ 1.8

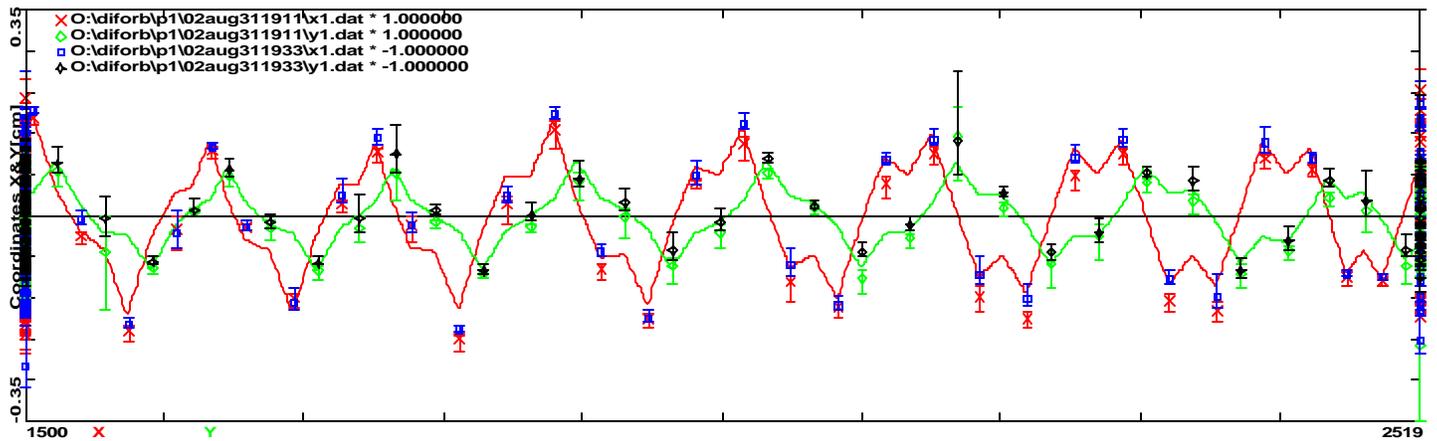
Amplitude ratios:	0.81-0.85=>0.69(x1)
Tevatron/MI =	1.61-0.85=>1.36(x2)
	1.38-0.95=>1.31(y1)
	0.96-0.95=>0.91(v2)



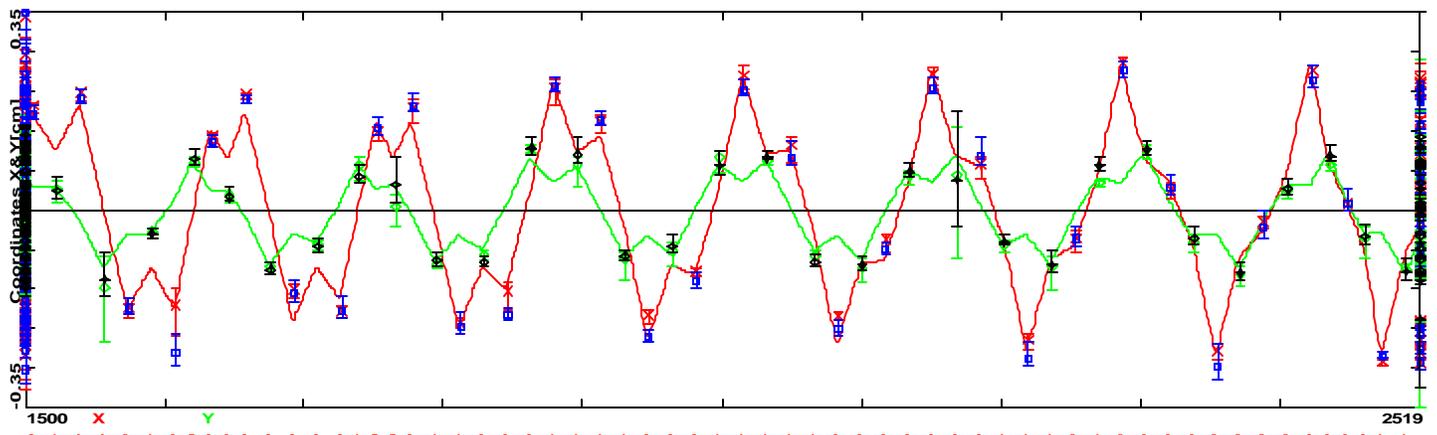
Betatron phases relative to the design betatron phase advance

Detailed analysis for P1 line measurements

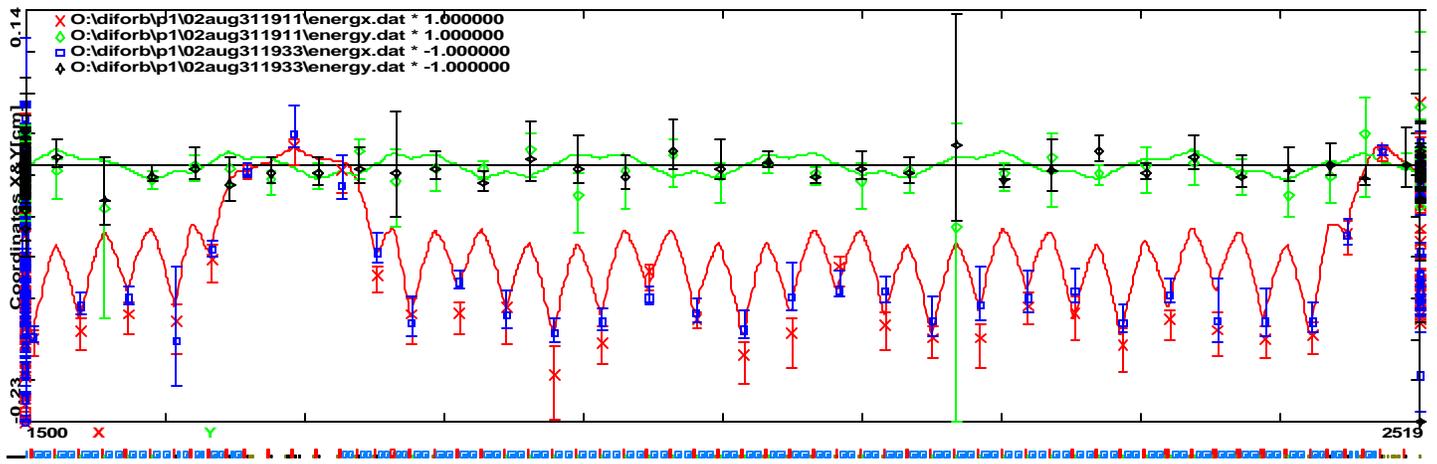
Thu Sep 05 12:10:21 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\P1_150\Measurements\02Aug31\MI_basic.



Thu Sep 05 12:10:59 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\P1_150\Measurements\02Aug31\MI_basic.

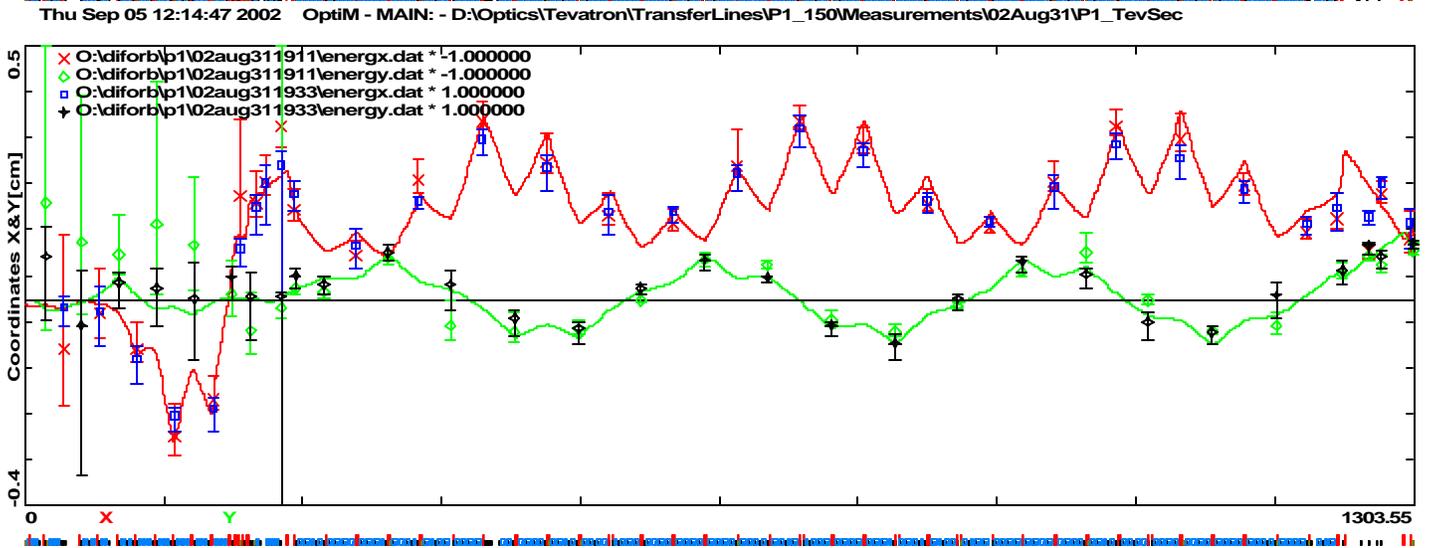
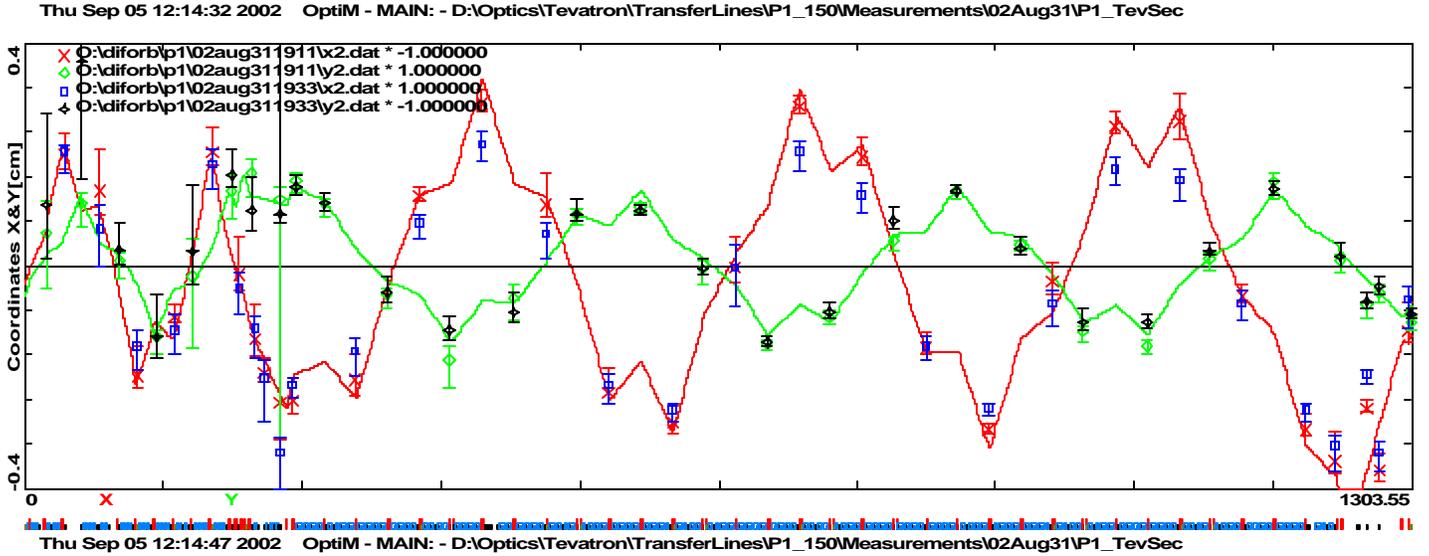
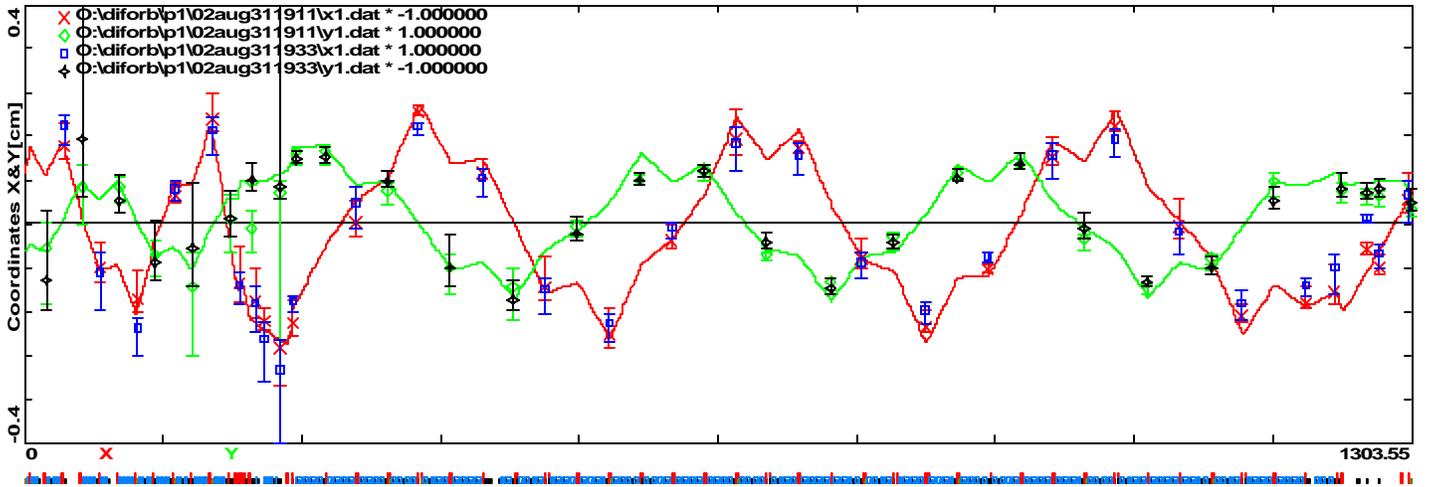


Thu Sep 05 12:11:09 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\P1_150\Measurements\02Aug31\MI_basic.



Differential orbits in MI before proton extraction point

Thu Sep 05 12:14:21 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\VP1_150Measurements\02Aug31\VP1_TevSec

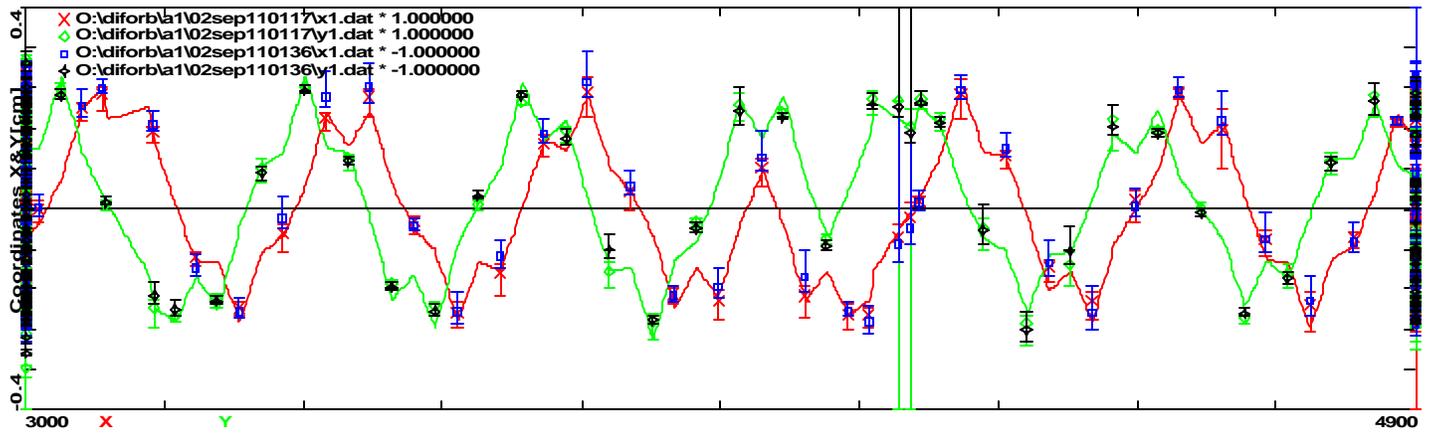


Differential orbits in P1 line and Tevatron sector F

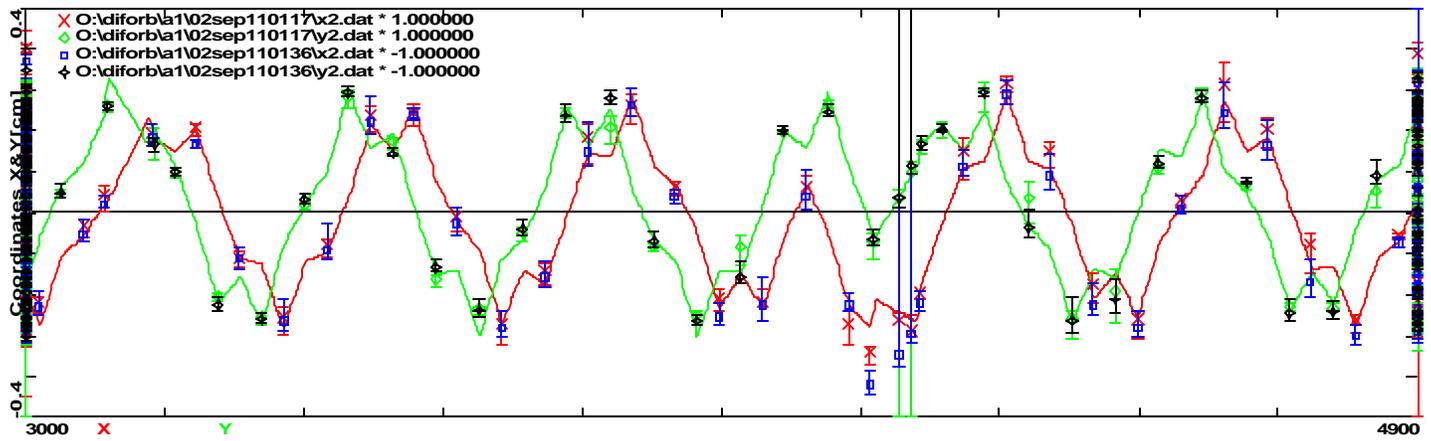
- Conclusions:**
1. Decent coincidence between data and model for the MI, P1 line and Tevatron; two quads in P1 line need to be fudged by a few percent to get an agreement between model and measur.
 2. There are small mismatches for both dispersions. It can be and need to be fixed but this is not the highest priority. New optics will be implemented after A1 line transfers will be improved.

Detailed analysis for A1 line measurements

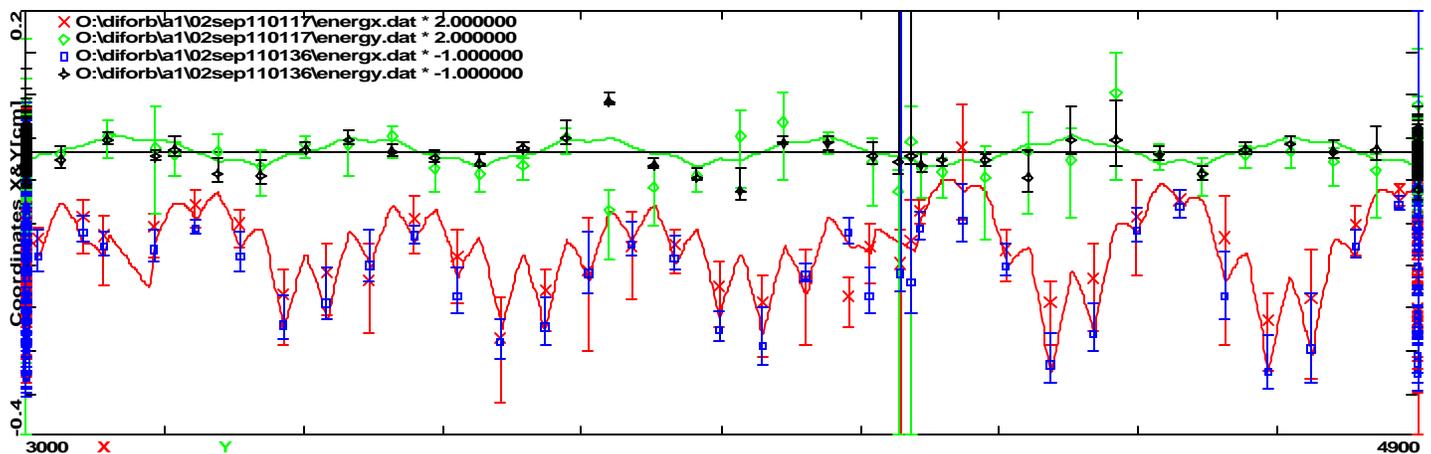
Wed Sep 11 14:00:37 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\VA1_150\Measurements\02Sep11\Tev03.opt



Wed Sep 11 14:02:30 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\VA1_150\Measurements\02Sep11\Tev03.opt

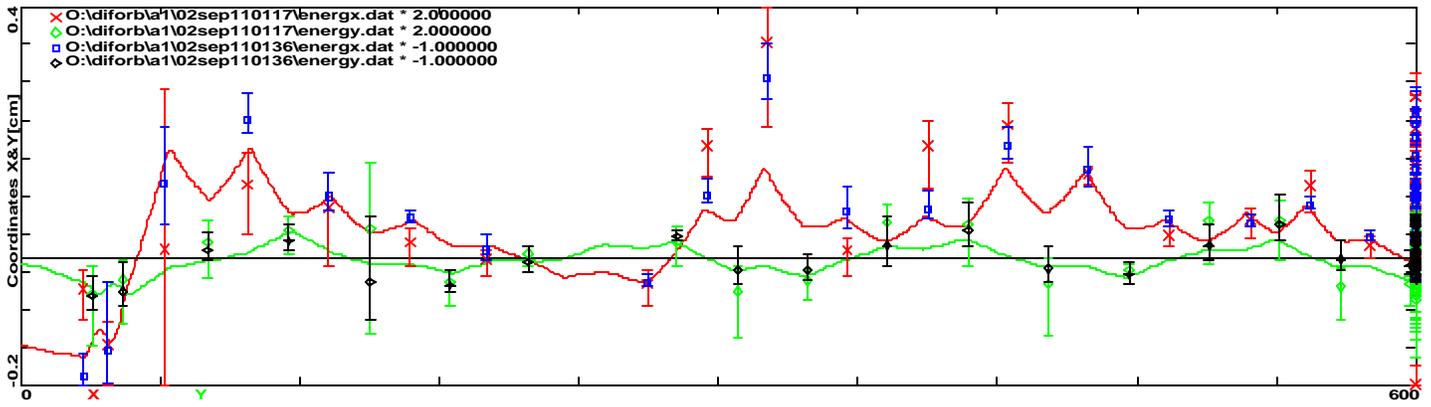


Wed Sep 11 14:02:51 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\VA1_150\Measurements\02Sep11\Tev03.opt

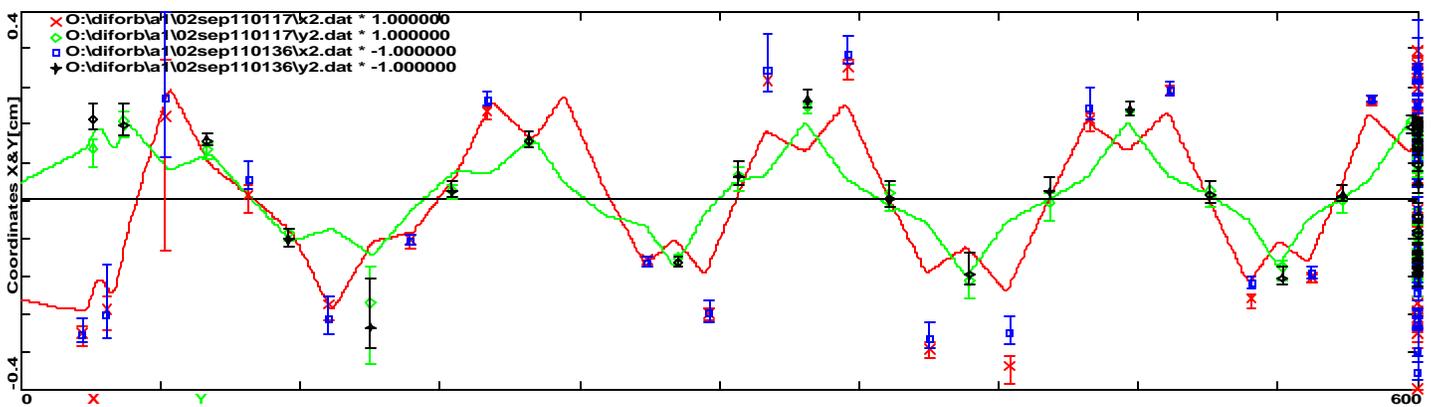


Tevatron differential orbits vicinity F0 reverse proton extraction. Tevatron Lambertson position is marked by vertical lines. Energy correction of $0.05/A1x=0.054\%$ corresponds to 80 Hz at T:VFKNOB
 Scaling for the kickers: $A_x=0.925$ $A_y=0.95$
 That yields that the horizontal Tevatron BPMs underreport beam displacements by ~8% (vertical by 5%).
 This is in a good coincidence with momentum compaction measurement.

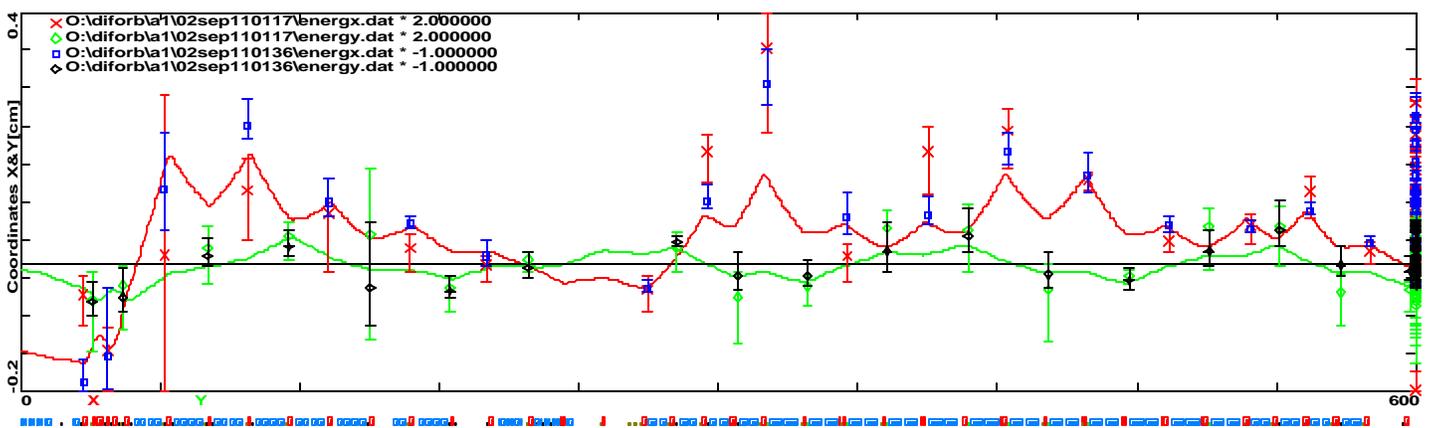
Fri Sep 13 09:34:04 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\A1_150\Measurements\02Sep11\A1inv_MI.



Fri Sep 13 09:34:21 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\A1_150\Measurements\02Sep11\A1inv_MI.



Fri Sep 13 09:34:33 2002 OptiM - MAIN: - D:\Optics\Tevatron\TransferLines\A1_150\Measurements\02Sep11\A1inv_MI.



Differential orbits in A1 line and MI

- Conclusions:**
1. An attempt to scale quadrupole measurements to fit the data was not successful
 2. Most probable reason of large discrepancies is incorrect BPM measurements
 3. There are no doubts that the betatron mismatch through A1 line is the leading reason for emittance growth for MI to Tevatron p-bar transfers

Plan of the attack

Studies

1. Turn-by-turn measurements in MI at 150 GeV
2. Perform differential orbit data taking for BPMs and multiwires for Tev to MI transfers
3. Differential orbit data taking in MI with larger excitation and better averaging
4. On-line optics tuning with orthogonal knobs (quads)

BPM repairs (Jim Crisp)

1. A1 line (Peter Priesto)
2. MI BPMs (Marvin Olson)

Analysis

1. Analysis of turn-by-turn data (M-J.Y)
2. Model checks and further analysis for differential orbits (VL)
3. Building new optics for A1 line (VL)